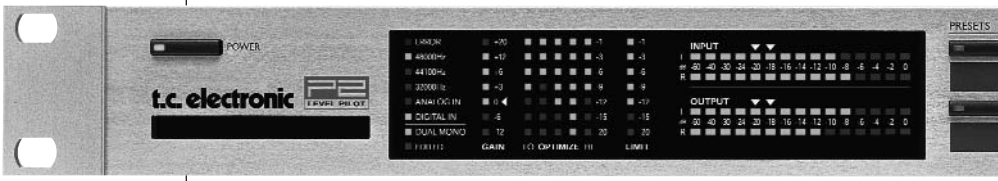
t.c. electronic®
ULTIMATE SOUND MACHINES

P2

LEVEL PILOT



ADMINISTRATOR'S MANUAL

IMPORTANT SAFETY INSTRUCTIONS

The lightning flash with an arrowhead symbol within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

---

1 Read these instructions.
2 Keep these instructions.
3 Heed all warnings.
4 Follow all instructions.
5 Do not use this apparatus near water.
6 Clean only with dry cloth.
7 Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8 Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9 Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10 Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11 Only use attachments/accessories specified by the manufacturer.
12 Unplug this apparatus during lightning storms or when unused for long periods of time.

Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13 Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Warning!

- To reduce the risk of fire or electrical shock, do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.
- This apparatus must be earthed.
- Use a three wire grounding type line cord like the one supplied with the product.
- Be advised that different operating voltages require the use of different types of line cord and attachment plugs.
- Check the voltage in your area and use the correct type. See table below:

Voltage	Line plug according to standard
110-125V	UL817 and CSA C22.2 no 42.
220-230V	CEE 7 page VII, SR section 107-2-D1/IEC 83 page C4.
240V	BS 1363 of 1984. Specification for 13A fused plugs and switched and unswitched socket outlets.

- This equipment should be installed near the socket outlet and disconnection of the device should be easily accessible.
- To completely disconnect from AC mains, disconnect the power supply cord from the AC receptable.
- The mains plug of the power supply shall remain readily operable.
- Do not install in a confined space.
- Do not open the unit - risk of electric shock inside.

Caution:

You are cautioned that any change or modifications not expressly approved in this manual could void your authority to operate this equipment.

Service

- There are no user-serviceable parts inside.
- All service must be performed by qualified personnel.

IMPORTANT SAFETY INSTRUCTIONS

EMC / EMI.
This equipment has been tested and found to comply with the limits for a Class B Digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in residential installations. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on. The user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

For the customers in Canada:
This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Certificate Of Conformity
TC Electronic A/S, Sindalsvej 34, 8240 Risskov, Denmark, hereby declares on own responsibility that following products:

P2 - Level Pilot

- that is covered by this certificate and marked with CE-label conforms with following standards:

EN 60065 (IEC 60065)	Safety requirements for mains operated electronic and related apparatus for household and similar general use
EN 55103-1	Product family standard for audio,video, audio-visual and entertainment lighting control apparatus for professional use. Part 1: Emission.
EN 55103-2	Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 2: Immunity.

With reference to regulations in following directives:
73/23/EEC, 89/336/EEC

October 2002
Mads Peter Lübeck
Chief Executive Officer

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INTRODUCTION

Welcome

The P2 is a “set and forget” Loudness pilot and Limiter for Post production and Broadcast. It is designed especially for fixed installations where a consistent loudness and spectral balance is required but excels also in peak limiting functions.

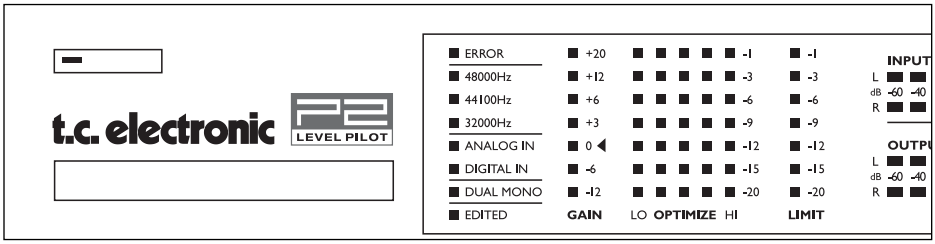
Factory loaded with a broad selection of World Standard Presets the P2 can be used right out of the box. However, via the TC Icon PC Editor, suitable presets can be built by the *Administrator* and various lock functions can be applied to ensure no unintended change of settings by the daily User. Once setup and loaded with presets any person doing video editing, audio production, audio mixing or tape-copying. Simply pick the predefined optimal preset and avoid having to think about audio levels again.

Concept

- **Audio editing for video**
- **Audio or tape copying**
- **Presets can be picked by non technical personnel with full confidence in output quality.**
- **Presets can be created by Audio Expert via TC Icon Software Editor.**
- **Easy cloning of multiple P2’s via standard PCMCIA card.**

Features

- **Dual mono, Stereo and Wide Stereo processing**
- **ALC - Automatic Loudness Control**
- **Filters and Parameteric EQ**
- **Live updatable Delay 0-1000 ms**
- **5-Band Compression**
- **Brickwall Limiter**
- **24 bit resolution Analog and Digital I/O**
- **48 bit internal processing**
- **Sample Rate Conversion selectable on/off**
- **All features mentioned available simultaneously**



About this manual

The latest manual revision can always be downloaded via www.tcelectronic.com

If you have questions unanswered by this manual you may also try looking at our TC Support Interactive site. This site is also accessed via www.tcelectronic.com

Daily User

Requirements
The P2 is correctly connected and loaded with relevant Front Presets by the *Administrator* and powered on.

Lock
The *Administrator* can decide to activate different levels of Lock functions. These may include lock of front panel key operation and/or lock of the Wizard and Bypass functions.
By the choice of the *Administrator* the selected Lock/Unlock function can be activated/deactivated either by:
- pressing LOCK followed by a four digit code specified by the *Administrator* or,
- holding lock for approx 2.5 seconds.

Selecting Presets
Press relevant preset key (1-8) to load preset. Presets can be loaded only if these keys are unlocked, (see above).
Presets are "total recall" presets. They set up all levels, I/O settings and algorithm parameters. Presets are defined by the experts user to perfectly match the downstream signal destination.

Wizard
The Wizard can be activated only if the Wizard functions are unlocked. (see "Lock" section above).
Once the Wizard is activated the P2 Level pilot examines the program material and automatically suggests optimal compression settings for highest output. The Wizard can be set by the *Administrator* to calculate three levels of compression; Low, Medium and High.

Administrator

More details on page 18-21 - and setup page 10 for reference.

Requirements
One P2 Level Pilot, a Pentium computer with Windows 95, 98, NT, 2000, ME or XP installed.

Installation of TC Icon Editor Software
Enter CD, open directory, run Setup and follow instructions.

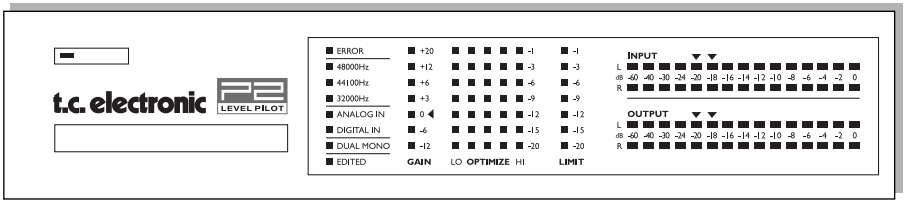
Connecting P2
- Connect a PC COM port to the P2 RS232 In. If possible, notice which computer COM port you have connected to.
- Programming the P2 does not necessarily require audio to be connected. However, if audio connections are needed connect audio according to Setup illustrations on page 10.

Getting started with the TC Icon Editor
- Power up the P2 and start the TC Icon software on your computer.
- Go to the Setup/Devices/Port page to select which COM(1-4) port you you have connected to. (per default the Editor will look at COM ports (1-4) automatically.
- Go to the Setup/Devices/Select page. Press DETECT and assign the detected P2 to one of the 8 device locations in the right side of the display. Simply press any of the 8 keys.
- Press the ICON key in the upper left corner to go the pages from where all local P2 parameters are controlled.
  Library Page: handles presets
  System Page: handles Clock, Level trims, Lock functions and the variable yellow LED Threshold.
  Engine: All algorithm parameters.

Cloning P2's using a PCMCIA card
This is the function used by the *Administrator* to clone multiple P2 using a PCMCIA card.

- Load appropriate presets into Front Panel Bank of the P2 you wish to clone.
- Insert an unprotected PCMCIA card into the P2 Card slot. (protection key is located on the edge of the card).
- Go to the System/Card page.
- Decide whether you wish to exclude System Preset that holds overall Clock settings, Analog Trim levels, Dither, Status Bit settings and settings for GPI. To exclude System Preset activate the "Exclude System Preset" key.
  Then press CREATE CLONE CARD.
- Remove card and go to the target P2 unit.
- Insert the card and power up using the front panel POWER key while holding the LOCK key pressed.
- Press the LOCK key again. In this mode the LOCK key operates as "CONFIRM".
  BYPASS can be used to abort operation.
- The target P2 is now loaded with the information present on the card.

FRONT PANEL OVERVIEW



POWER On/Off
Switches power On/Off.
To completely disconnect from mains the Rear panel POWER switch must be used.

PCMCIA slot
For software updates and preset backups.

ERROR LED
Indicates various error states.

48/44.1/32 kHz LEDs
Indicates current Sample Rate.

ANALOG IN/DIGITAL IN
Indicates currently selected Input type.

DUAL MONO LED
Indicates that the P2 is operating in Dual mono mode.

EDITED LED
Indicates that the currently recalled preset has been edited but not stored.

NOTE This LED will also be lit when the Wizard has been activated.

GAIN meter
Indicates the max gain applied on either channels. The indication is “wideband” type.

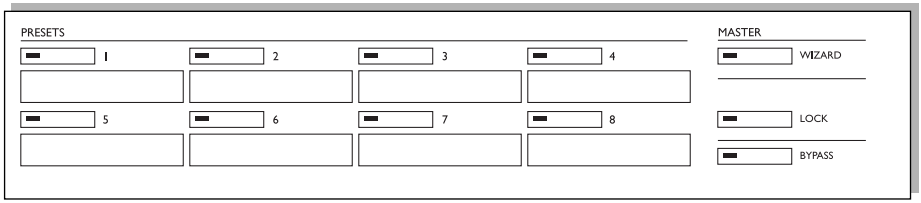
OPTIMIZE meters
Indicates the gain optimization on each of the 5 bands.

LIMIT meter
Indicates the max limitation performed on either channels.

INPUT/OUTPUT meters

- The Input meters indicate the level of the Input signal after the In Gain control. (set via the TC Icon control interface).
- The Output meters indicate the current Output level.
- Threshold value for meter color change:
  For both Input/Output meters: Below -20dB the meter LEDs are green. From -20dB to 0dB LED color can be green or yellow.
  The value for this color change is set via the TC Icon Editor on the System Front page.

FRONT PANEL OVERVIEW



PRESET keys 1-8
Presets can be recalled from these keys. Press preset keys 1-8 to instantly recall Front presets. This type of presets include settings of all gain and processing parameters.
Keys can be locked by the *Administrator*.

Below each key you can write preset names. Use the supplied lithographic crayon or similar.

WIZARD key
Using the Wizard function the P2 listens to a section of the program material; analyzes and thereafter automatically adjusts settings using the ALC to achieve optimal level thus keeping dynamics intact.

Via the TC Icon Editor three Wizard compression modes can be set: Light, Normal or Heavy. The Wizard mode is set by the *Administrator*.
It is NOT possible to change Wizard mode via the P2 frontpanel.

When the Wizard is activated the Edited LED will be lit.

To prevent unintended use of the Wizard the WIZARD key can also be locked. All lock functions are set via the TC Icon PC Editor. When Wizard is locked it is inoperable from the front panel controls.

LOCK key
The LOCK key is used to lock/unlock various functions. This is set up via the TC Icon Editor.

Lock Activation
Via the TC Icon Editor two Lock activation modes can be selected.
In one mode two separate four digit codes can be set to unlock and lock. The code is set up via the TC Icon PC Editor.
With the other lock mode selected lock/unlock can be performed simply by holding the LOCK key pressed for 2.5 seconds.

Lock Modes:
Disable:
Wizard is disabled and no front panel keys are locked.

Lock Wizard:
Wizard is disabled but Preset recall keys are active.

Lock Recall:
Preset recall is disabled but Wizard function is active.

Lock Panel:
No front panel controls are active until LOCK key is pressed followed by the four digit code.

BYPASS key
Press to bypass all processing. Input audio signal will be passed unprocessed to the P2 Outputs.

REAR PANEL

Power Input 100 - 240V

Power Switch

Balanced Analog Inputs XLR

Balanced Analog Outputs XLR

BNC Sync In

AES/EBU Input/ Output

S/PDIF Input/ Output

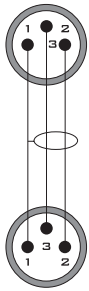
RS 232 9 pin Sub D

GPI IN

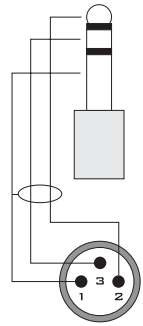
RS232 : For connecting to a PC. Use a standard 9 pin Sub D cable. (Supplied)

GPI In : Use standard stereo 1/4" jack. (not supplied)
BNC : Use standard shielded 75 Ohm Coax cable with BNC connectors. (not supplied)

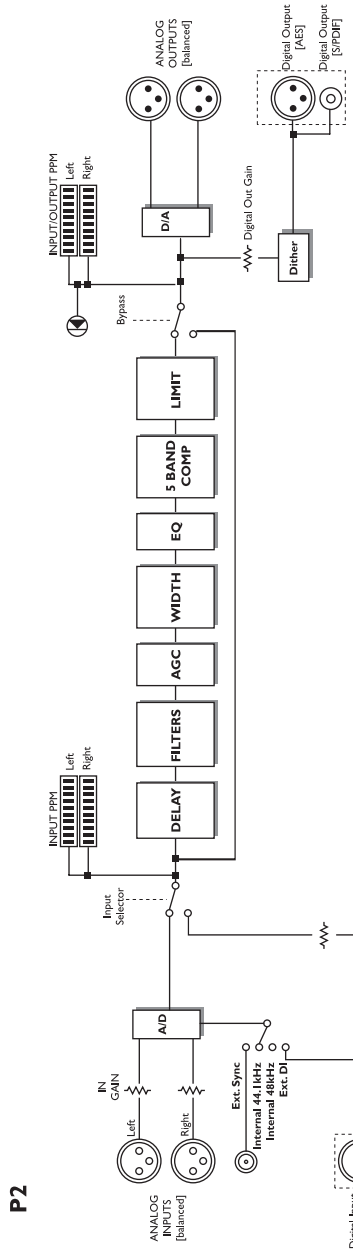
XLR to XLR



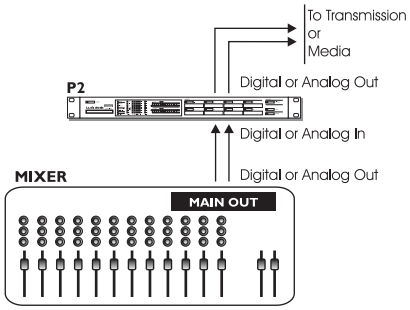
XLR to Jack Stereo



SIGNAL FLOW


P2
ANALOG INPUTS [balanced]
Left
Right
IN GAIN
A/D
Ext. Sync
Internal 44.1kHz
Internal 48kHz
Ext. DI
SRC
AES/EBU
S/PDIF
Digital Input [AES]
Digital Input [S/PDIF]
Input Selector
INPUT PPM
Left
Right
DELAY
FILTERS
AGC
WIDTH
EQ
5 BAND COMP
LIMIT
Bypass
INPUT/OUTPUT PPM
Left
Right
D/A
ANALOG OUTPUTS [balanced]
Digital Out Gain
Dither
Digital Output [AES]
Digital Output [S/PDIF]

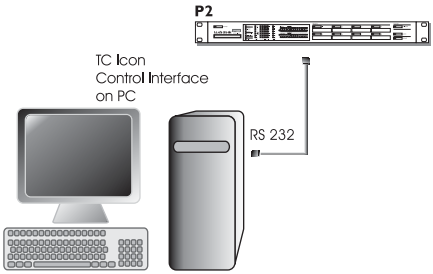
Connecting and Setting up the P2



In use - no TC Icon Editor/PC connection necessary.

- Connect your audio source material to P2 Inputs. Options are balanced Analog, digital AES or S/PDIF.
- Connect Outputs to relevant media.
- Select preset via the eight front panel PRESET keys.

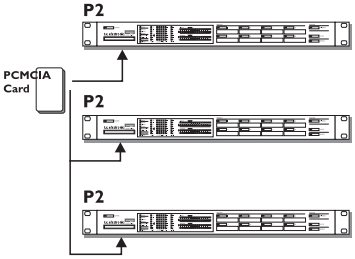
  Note that; Input type, Sync settings, and Sample Rate Conversion settings are set on preset level via the TC Icon PC Editor on the Engine I/O page.



***Administrator*s Setup for preset programming plus Wizard and Lock definition using the TC Icon PC Editor.**

- Connect a free RS232 serial COM port on the computer to the RS232 connection on the rear of P2.
- Start the TC Icon PC Editor and select appropriate COM port.
  (Read TC Icon installation procedure section)

Make audio connections if these are necessary for programming.



Cloning P2's using a standard PCMCIA card
Once the *Administrator* have designed and setup presets for various applications using the TC Icon PC Editor, other P2's in the house may be easily cloned using a standard PCMCIA card.
In other words; it is NOT necessary to hook up every single P2 to a computer to set these up.

- Load appropriate presets into U1 Front Panel Bank of the P2 you wish to clone.
- Insert an unprotected PCMCIA card into the P2 Card slot. (not supplied)*
- Go to the System/Card page.
- Decide whether you wish to exclude System Preset 1 that holds overall Clock settings, Analog Trim levels, Dither, Status Bit settings and settings for GPI. To exclude System Preset activate the "Exclude System Preset" key.
  Then press CREATE CLONE CARD.
- Remove card and go to the target P2 unit.
- Power off target P2 unit.
- Insert the card and power up using the front panel POWER key while holding the LOCK key pressed.
- Press the LOCK key again. In this mode the LOCK key operates as "CONFIRM".
  BYPASS can be used to abort operation.

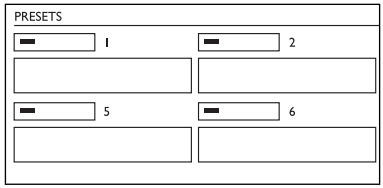
The Front bank is now copied to the "target P2" and the 8 presets can be loaded using preset keys 1-8 depending on the defined lock mode.

* PCMCIA cards can be acquired through any TC Electronic dealer

Two levels of P2 operation
First of all the “every-day-use” where the less experienced user basically selects predefined presets and occasionally the Wizard that intelligently analyze program material and suggests compression settings for that particular material.
Secondly the “*Administrator*s level” accessed only via the TC Icon Software Editor on PC. This is where Presets, I/O, Wizard, Lock and System settings are setup.

Recall

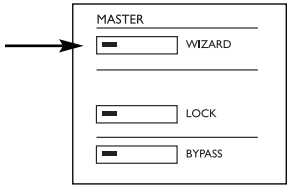
- Press one of the eight keys to recall a preset.



Front Panel Presets:
The 8 Front Panel presets can be instantly recalled via the front panel preset keys. Recalling presets via the eight front-panel keys are total recalls. Both system parameters and preset settings are recalled.

These presets are created by the *Administrator* via the TC Icon Editor and are not edited in everyday use.

Wizard

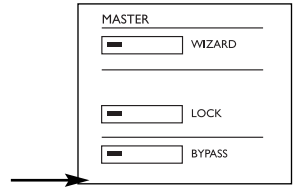


A function used to optimize level based on an examination of a section of material.

- Play programming material containing both high and low-level passages.
- Press WIZARD to start the Wizard.
- Press again after a period of time; 5-10 seconds.
- The Wizard has now suggested optimal settings for your specific program material.

Note that; the Wizard can be locked by the *Administrator* via the TC Icon Editor.

Lock



The *Administrator* can setup various lock functions/modes for the P2 via the System/ Front page in the TC Icon PC Editor. Setting up via the TC Icon Editor is explained later in the manual. This section merely lists the options. The *Administrator* sets up both how the Lock function can be activated/deactivated from the front panel, but also which functions that are locked once Lock is activated.

Lock Activation
Two modes are available for Lock activation/deactivation. These modes are defined and setup by the *Administrator* via the TC Icon PC Editor.

Hold mode: The Lock mode can be activated/ deactivated by pressing and holding the LOCK key for approx. 2.5 seconds.

Code mode:
The Lock mode can be activated by pressing the LOCK key for two seconds.
To unlock; the LOCK key must be pressed followed by entering a four digit code (within 5 seconds) using the eight front panel preset keys (1-8).
Separate codes for lock and unlock can be defined by the *Administrator*.

Lock Define
One of four Lock definitions can be selected via the editor by the *Administrator*.

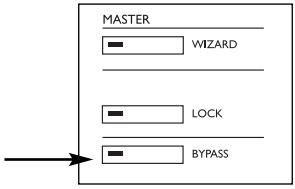
Disable:
No lock function is available.

Lock Wizard:
Wizard function is disabled and cannot be activated via the front panel WIZARD key.

Lock Recall:
No presets can be recalled via the eight front panels preset keys and the Wizard function is also disabled.

Lock Panel:
The entire front panel, recall functions, Bypass and Card dump functionality is disabled.

Bypass



The function of the front panel BYPASS key is set via the **System Front** page on the TC ICON editor.

Four Bypass modes are available:

- Normal:
  No delay in bypass. Dither active.
- Relay:
  Bit transparent digital plus analog Bypass relay.
- Codec:
  No delay in bypass.
  Bypass is bit transparent.
- Codec Delay:
  Delay is active in bypass.
  Bypass is bit transparent. The Delay time is set on the Engine Main page.

Note: If P2 is used with data-reduced signals such as MPEG, DOLBY E or DTS, use one of the Codec Bypass modes described above.

It is also possible to lock the front panel BYPASS key so no unintended bypass can be performed.

INSTALLATION - OF THE TC ICON SOFTWARE EDITOR

Requirements for running the TC Icon Software Editor

- A Pentium PC, or compatible, with any of the following operating systems: Windows 95, Windows 98, Windows NT, Windows 2000, Windows ME or Windows XP.

The CD-ROM

The CD delivered with the TC Icon Software Editor contains:

- A folder called: TC Icon Software Editor - update version. Use this if the MS Installer* is already on your computer.
- A folder called: TC Icon Software Editor + MS Installer (use this if MS Installer is not on your computer - see below)
- The P2 Manual in PDF format.

Installing

- the TC Icon Software Editor

Your computer probably holds the required MS Installer program and you only need to run the file called: TC Icon x.xx.msi
This file is located on the CD in the folder called:

TC Icon Software Editor - update version

- Exit all programs on your computer and open the CD contents.
- Open the folder called: TC Icon Software Editor - update version.
- Copy the file called TC Icon x.xx.msi to a location on your computer.
- Double-click on the Icon and follow the instructions.

A TC Icon shortcut will appear both on the desktop and in the Start menu.

Problems?

If you during the process described above have discovered that the required MS Installer program is NOT already on you computer you should run the installation file including the MS installer: TC Icon x.xx.zip
This file is located in the folder called:

TC Icon Software Editor + Microsoft Installer.

This file includes both the Microsoft Installer Service as well as the TC Icon Software Editor

- Exit all programs on your computer and open the CD contents.
- Open the folder: “The TC Icon Software Editor + MS Installer” and double click on: “TC Icon x.xx.zip”.
- Select a location to unzip to. Windows/Temp is automatically suggested.
- Press FINISH.
- Restart your computer on request.
- After restart, the installation of the TC Icon Software Editor will proceed.
- Follow the instructions.

A TC Icon shortcut will appear both on the desktop and in the Start menu.

* The MS installer is a small installation program by Microsoft necessary to run a regular .msi-update.
The program is installed in most computers running Windows 98 SE and up.

THE TC ICON EDITOR

Introduction

The TC Icon Software Editor is a generic Editor that currently controls the following products by TC Electronic: System 6000, DB-8 and P2.
In this section only subjects relevant for usage with the P2 will be discussed.

As described the P2 is connected via a serial COM port. System 6000 and DB-8 are connected via ethernet.

Navigating the Software Editor or TC Icon display is easy as soon as a few basic elements are explained.

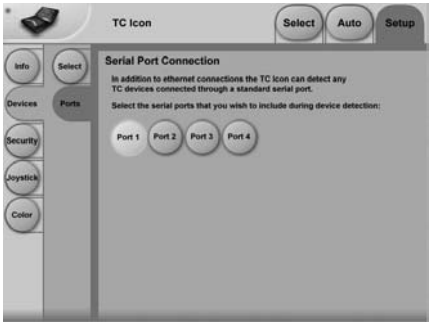
Generally :

- Press the top-tabs to do primary selections.
- Press the side-tabs or elements to do secondary selections.
- Press parameter value fields to instantly assign parameters to Fader 6.
- Adjust values using Faders 1-6.

(also see LINK explanation on next page)

Unpacked and ready

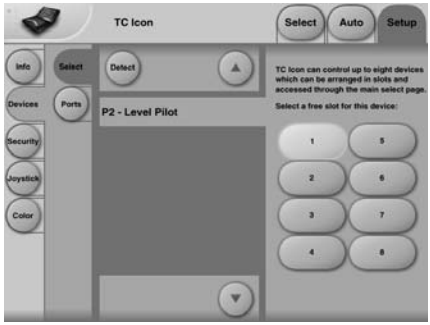
- Connect according to illustrations on page 10. Note to which COM port you connect the P2.
- Install software according to explanation on the previous page of this manual.
- Power up the P2 and start the TC Icon software on your computer.
- Go to the Select/Port page to select which COM(1-4) port you you have connected to.



- Select Port.
  (Note that the first time you open the Setup Port page all COM-ports 1-4 are selected).

NOTE Another active application may conflict with the selected COM Port. If this is the case you should close that application or connect the P2 to another COM port.
Also see Trouble-shoot section in this manual

- Then go to the TC Icon Setup/Devices page.



- Press the DETECT key. The TC Icon Editor will scan the System and find the connected P2's.
- When the connected P2 is detected, assign the unit to one of the eight shortcut keys in the right side of the display, by pressing one of the eight keys (see above). Any key will do. When several units are connected this page serves as a convenient organizer for the entire system.
- Go to the Select page (top-tab), and you will see a screen similar to the one below depending on number of connected units and in which locations you have assigned them.

- Press the large P2 key.
- TC Icon now retrieves data from the P2.
- When ready you will see the Main operating display.

Basic Operation

The **Icon Link** key in the upper left corner allows you to navigate between two main pages/modes.

Fig 1 - Setup/Select page

Via the "overall" Select & Setup pages you access overall settings and choices like:

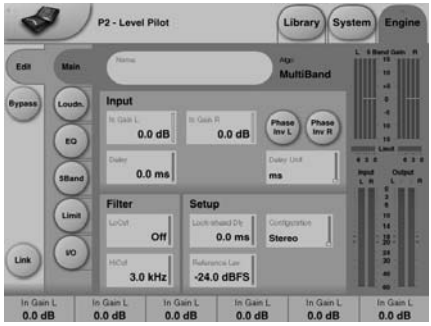
- Selection of which connected unit to operate.
- Enable devices to network.
- TC Icon settings such as display and Fader-appearance.

On the Select page illustrated above (Fig 1) all connected units will appear. Press one of the units indicated on that page.

Auto page

This page is redundant when operating a P2.

Fig 2 - Operating pages

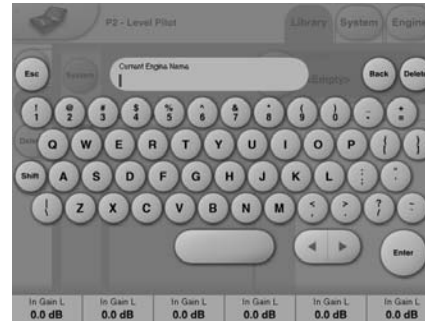


Press the **Icon Link** key in the upper left corner to select these pages.
These pages are relevant to one specific unit.

Library pages handle operations such as preset Recall/Store and Delete.
System pages handle overall Clock Settings, I/O settings and network settings.
Engine pages is where you control all algorithm specific processing parameters.

Renaming presets

All user presets can easily be renamed.
Click on the CURRENT ENGINE NAME key on the Store page and a keyboard display will open.



NOTE

The preset is not stored by entering the name and pressing ENTER.
To actually store a preset the STORE key must be pressed on the Store page.

Link

The LINK key allows you to assign any algorithm parameter to any of the 6 Faders. Thereby you are not limited to operate only the parameters visible on the current page. You can have e.g. In gain parameter from the Main page on Fader 1 and the Loudness Level trim from the Loudness page on Fader 2 etc.

To assign a parameter

- Press the LINK key.
- Select the Fader you wish to link a parameter to, by pressing the field just above the fader.
- Press the parameter you wish to link to the selected fader.

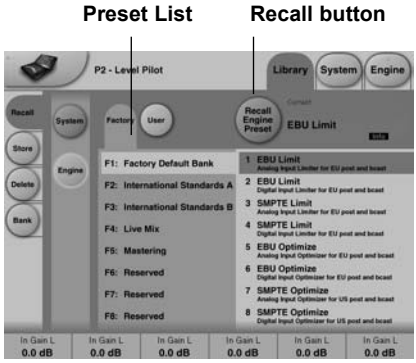
PRESET STRUCTURE - RECALL/STORE/DELETE

Library Pages

These are the pages from where all preset handling is controlled when using the TC Icon Editor.

To recall a preset:

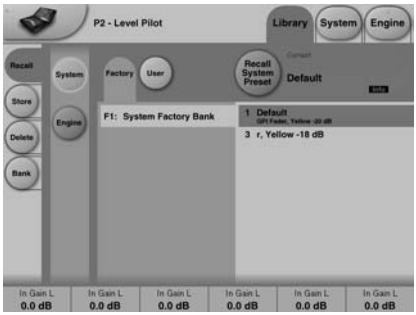
- Simply select the desired preset by clicking on the preset name in the list.
- Then press the RECALL button



System Presets:

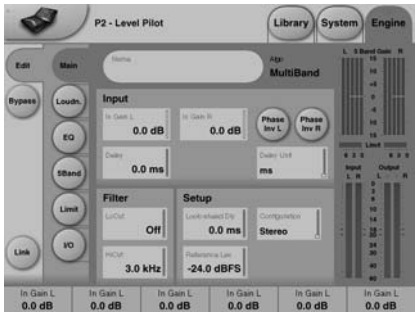
There are 3 System User memory locations plus 1 Factory Default. Neither are affected by Normal recall operations.
System User memory 1 is always recalled on machine Power On.

System presets include:
Analog Trim, Meters, Dither, Remote and Bypass settings.
Please see further description on System parameters later in this manual.



Engine Presets

Engine presets holds all parameters and settings from the Engine page.



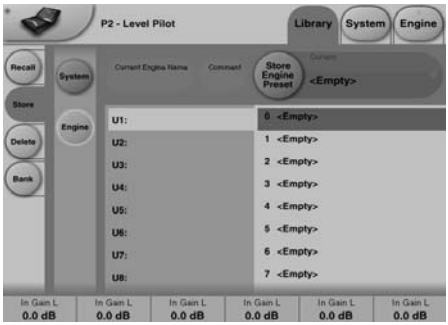
User presets
The User banks U1 to U8 can hold up to 8 presets each. U1 is equivalent to presets that can be recalled from the eight Front panel PRESET keys.

Factory Presets:
P2 comes loaded from the factory with a collection of general purpose Factory presets organized in banks of 8.

Store - Delete

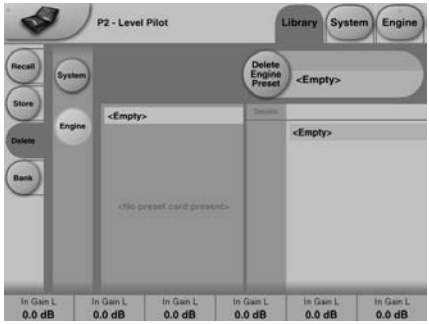
To store a preset:

- Select the Store page pressing the STORE side tab.
- Select a preset location.
- Press STORE.



To delete a preset

- Select the Delete page by pressing the DELETE side tab.
- Select the preset you wish to delete. Press DELETE.

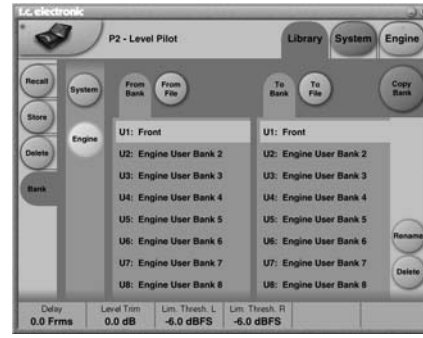


When Presets are Stored or Deleted, parameters from the In/Out page and Engine Layers are always affected.
System parameters on the other hand are unaffected by any other commands than a specific System Store or System Delete.

Bank Handling

Via the Library-Bank page it is possible to:

- Backup and retrieve the System User bank.
- Backup and retrieve any user bank (U1 to U8) to any user bank location (U1 to U8) or to your harddisk.



From Bank
On this page you select which bank on the P2 you wish to copy from.

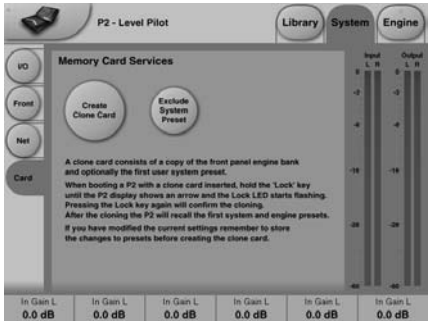
From File
If you have already stored banks on your computer this is where the files will appear.

To Bank
Select to which P2 bank you wish to copy the Selected bank to.

To File
Select **"To File"** if you wish to Back up the selected bank to your harddisk.

NOTE The TC Icon saves the bank files in a specific location. The location varies slightly between the different operation systems.
As an example Windows 2000 saves backup files in: Application Data\TC Electronic\TC Icon\P2 Presets\xxxxx
Do not move the files from this location or the TC Icon will not display the presets in the "**From File"** screen.

Cloning P2's



Creating the Clone Card
To easily clone multiple P2's a PCMCIA card is used.

- Load appropriate presets into Front Panel Bank of the P2 you wish to clone.
- Insert a 512kb or 1Mb PCMCIA card in the Card slot on the P2 front panel.
- Go to the System Card page.
- Decide whether you wish to exclude System Preset 1 that holds overall Clock settings, Analog Trim levels, Dither, Status Bit settings and settings for GPI.
  To exclude System Preset activate the "Exclude System Preset" key.
- Press the **CREATE CLONE CARD** key on the System/Card page.

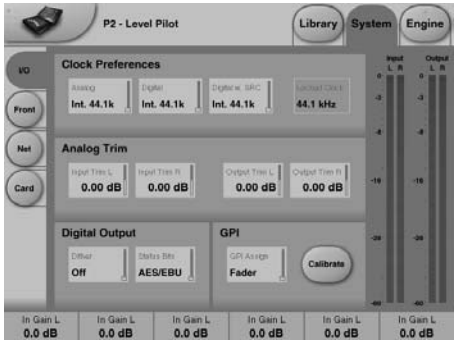
NOTE

- Please note following: ALL DATA previously stored on the card will be destroyed when formatting the card.
- If the card is write-protected no data can be written on the card. The protect/un-protect- switch is located at the edge of the card.

Loading/Cloning P2 using the Clone Card.
Once the clone card has been created on the P2 hooked up via the TC Icon PC Editor it is time to transfer the card data to other P2's in your facility.

- Insert the PCMCIA card in the "target" P2.
- Press and hold the LOCK key while powering up the P2.
- Press the LOCK key again. In this mode the LOCK key operates as "CONFIRM".
  BYPASS can be used to abort operation.
- The target P2 is now loaded with the information present on the card.

SYSTEM - I/O PAGE



Parameters on the System page can be stored and recalled via System presets and are unaffected by normal Recall operations.

Clock Preferences

Analog

Range: Internal 44.1kHz
Internal 48kHz
Ext. W. Clk. (External Word Clock)
Ext. DI

Sets the processing clock frequency when analog Inputs are used.

Digital

Range: Internal 44.1kHz
Internal 48kHz
Ext W Clk (External Word Clock)
Ext. DI

Sets processing clock frequency when processing signal on the AES or S/PDIF Inputs.

Digital w. SRC

Range: Internal 44.1kHz
Internal 48kHz
Ext Word Clock

Sets the processing clock frequency when Digital SRC is selected on the Engine I/O page.

Analog Trim

Input Trim L & Input Trim R

Range: 0.05 to 41dB
Level trim for Analog Inputs

Output Trim L & Output Trim R

Range: 0.05 to 41dB
Level trims for Analog Outputs.

Digital Output

Dither

Range: 8, 12, 14, 16, 18, 20, 22, 24, off
P2 processes internally at 48 bit resolution. Dither must be set to match downstream devices.

Status Bits

Select whether the P2 should send out AES/EBU or S/PDIF status bit information.

GPI

Via an external Fader or alternating (latching) switch various functions can be controlled.

GPI Assign

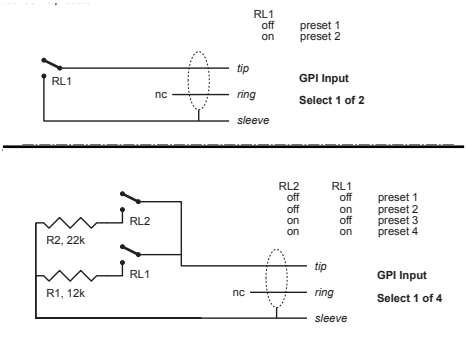
Disabled
Connected device to GPI is disregarded.

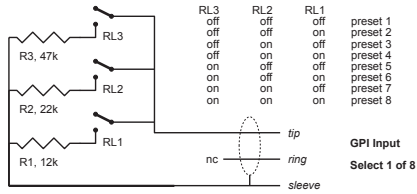
Fader
Connect e.g. a TC Master Fader (not included) to control the Master Out level parameter. (see calibrate section next page).

Bypass
Connect an alternating (latching) switch to remote control Bypass function. Note that the Bypass function is defined on the System Front page. (see calibrate section next page).

Preset
Range: 2 presets, 4 presets or 8 presets
Selection between up to 8 presets (equivalent to the Front Panel recall keys) is achieved by feeding the processor a DC voltage to its 1/4" jack input. The Input voltage is compared against voltage windows that correspond to certain presets.
Between the valid voltage windows, invalid windows have been inserted to protect against erratic operation. The processor constantly monitors the GPI Input, and only if several consecutive measurements point to the same, valid voltage window, a recall is performed. The voltage windows chosen enable easy "binary relay encoding" as shown on the next page in fig. 1. If long cable runs are required, HF decoupling using a ceramic capacitor across the Tip and Sleeve terminals inside the jack plug may be indicated.

NOTE The ring terminal of the 1/4" jack is not used.





GPI Technical specifications

Inside the processor, a 10kohm resistor connects the Tip terminal to a +5V power supply. When nothing is connected to the GPI input, the input voltage therefore is +5V. Resistors can be used to pull down the voltage as suggested in Fig 1.

In Table 1, voltages outside the limits mentioned are to be considered invalid. No action is taken if invalid measurements are made. GPI recall action resumes when a stable, valid measurement again is detected.

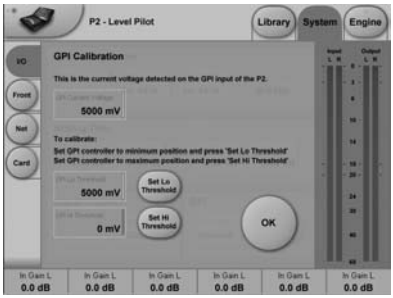
Mode	Preset No	Target / Vs	Min typ / V	Target typ / V	Max typ / V
1 of 2					
	1	1.000	2.67	5.00	5.00
	2	0.000	0.00	0.00	0.51
1 of 4					
	1	1.000	4.16	5.00	5.00
	2	0.687	3.38	3.44	3.50
	3	0.545	2.67	2.73	2.79
	4	0.438	0.00	2.19	2.25
1 of 8					
	1	1.000	4.50	5.00	5.00
	2	0.824	4.06	4.12	4.18
	3	0.687	3.38	3.44	3.50
	4	0.600	2.94	3.00	3.06
	5	0.545	2.67	2.73	2.79
	6	0.489	2.38	2.44	2.50
	7	0.437	2.13	2.19	2.25
	8	0.400	0.00	2.00	2.06

NOTE Rather than absolute voltage measurements, the windows are defined as a fraction of the supply voltage, Vs. This voltage can be measured with a high impedance DMM on the Tip terminal when no pull down resistors are applied.The table shows values as a fraction of Vs, and, as a guideline, typical voltages when Vs=5.000V. (If the Supply voltage is e.g. 5.015V, the table should be corrected by multiplying these values by 5.015/5).

If GPI Preset mode is selected and no connections are made to the GPI Input the P2 will always recall preset 1 at power up.

Delay
Frame compensation Delay. Actual Delay time can be tapped using a connected momentary switch.

Calibrate



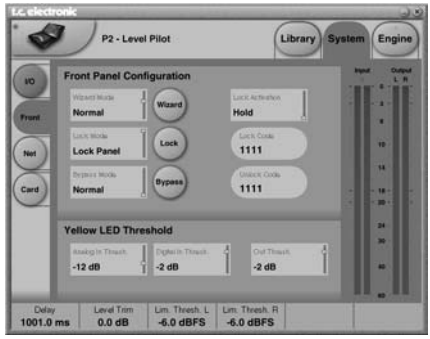
Use this function to calibrate P2 to a connected GPI controller. E.g. TC Master Fader (not supplied).

To Calibrate:
- Connect GPI Controller to GPI Input and press CALIBRATE.
- Set GPI controller to Minimum position and press “Set Lo Threshold”.
- Set GPI controller to Max position and press “Set Hi Threshold”.
- Press OK and calibration is done.

GPI Current voltage:
Indicates the current voltage on the GPI Input. With no GPI controller connected the voltage is 1000 mV. Therefore it is worth noticing the max indicated value on e.g. Master Fader is a lower value in voltage compared to the min value.

Front Panel Configuration

On this page various preferences for the Front panel controls are set.



Wizard Mode

This parameter sets up the functionality of the front panel WIZARD key. The Wizard function examines part of the program material and automatically finds optimal compression settings based on the evaluation and the selected mode.
Via the TC Icon Editor the *Administrator* can both enable/disable the WIZARD function and also select between the three modes that determines the intensity of the compression.

Modes
Light
Mild compression is applied for preserved yet controlled dynamics. Only 1 to 2dB.

Normal
Medium compression is applied. 3-4 dB

Heavy
A harder compression for maximal control of dynamics. The compression is typically up to 6-8dB. Consider whether the processing material will suffer from this type of compression.

Lock Mode

This parameter sets up the functionality of the front panel LOCK key. Thereby the editing options for the everyday user can be limited to different degrees.
Press the round LOCK key to activate the Lock function.

Disable:
No lock function is active.

Lock Wizard:
Wizard function is disabled and cannot be activated via the front panel WIZARD key.

Lock Recall:
No presets can be recalled via the eight front panels preset keys but the Wizard function is enabled.

Lock Panel:
The entire front panel, recall functions, Bypass and Card dump functionality is disabled.

Lock Activation

The two Lock activation modes defines how the Lock function can be activated/deactivated from the front panel.

Hold : Lock/unlock can be done by holding Lock key for 2 seconds
Code : Four digit code entered via the eight front panel controls is needed to unlock front panel controls.

NOTE The unlock code must be entered within 5 seconds.

Bypass Mode

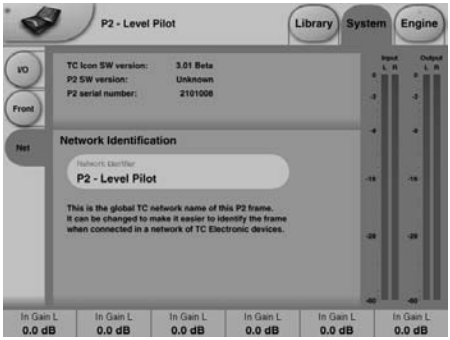
Press the round BYPASS key to activate.
Normal : No Delay in bypass and Dither is active
Relay : Bit transparent digital and analog Bypass Relay
No Codec Delay : No delay in bypass. Bypass bit transparency.
Codec Delay : Delay active in Bypass. Bypass bit transparency.

Lock Code/Unlock Code

Enter the lock/unlock codes that needs to be entered to lock/unlock front panel controls when in Lock mode (see above).

Yellow LED Threshold

Analog In, Analog Out & Out Threshold
Range: 0 to - 20dB
Sets the response Threshold for the two yellow digits in the In/Out meters.



The upper part of this page holds information on the current software versions and the serial number of the accessed unit.

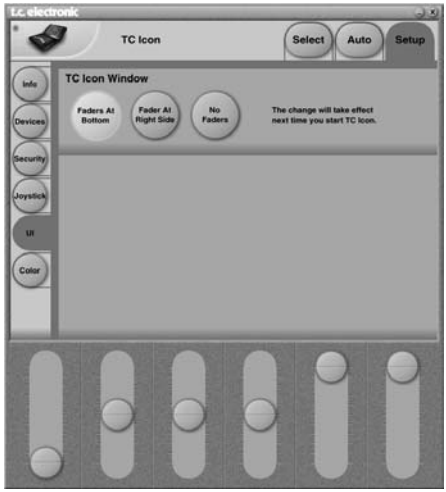
Network identification
A simple naming function that enables you to name each connected unit.

UI - Icon Views

On the Icon Setup page two sub-pages are available for controlling the TC Icon appearance.

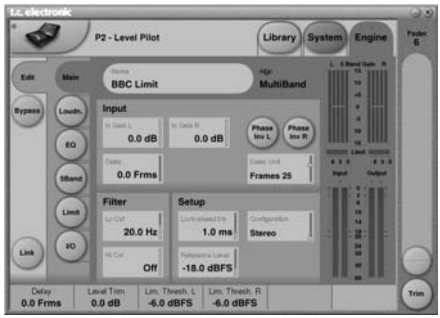
Fader appearance
Three options are available. Changes will take place next time you open the TC Icon.

Faders at bottom

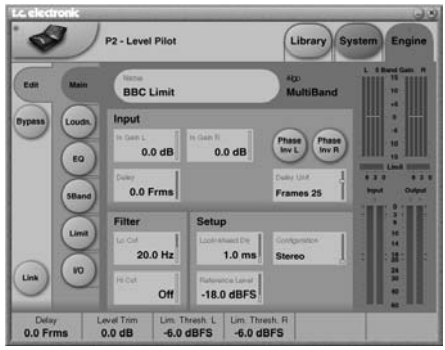


I/O PAGE

Fader at right side

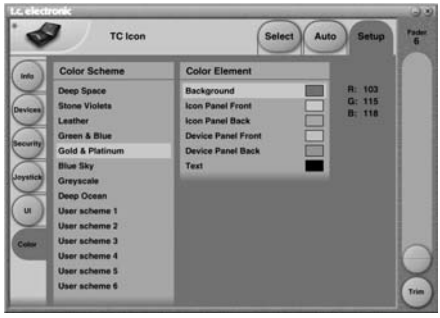


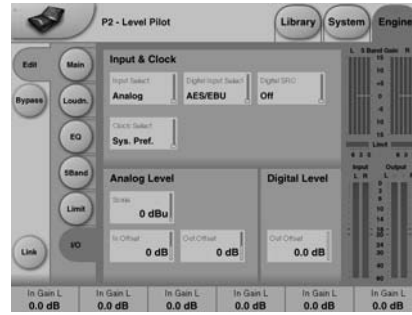
No faders



Color Page

Select a color scheme to your liking or make your own.





Input & Clock

Input Select
Range: Analog, Digital
Select appropriate Input type.

Digital Input Select
Range: AES/EBU, S/PDIF
Select type of digital Input format.

Clock Select
Range: Internal 44.1, Internal 48k,
Word Clock, Ext DI
Select to which clock the P2 should sync.

Digital SRC
Range: On/Off
Sets whether the P2 should perform Sample Rate conversion on the incoming clock or not.

Analog Levels

Analog Scale
Range: -3 to +27dBu @ Full scale
Sets Analog Input sensitivity.

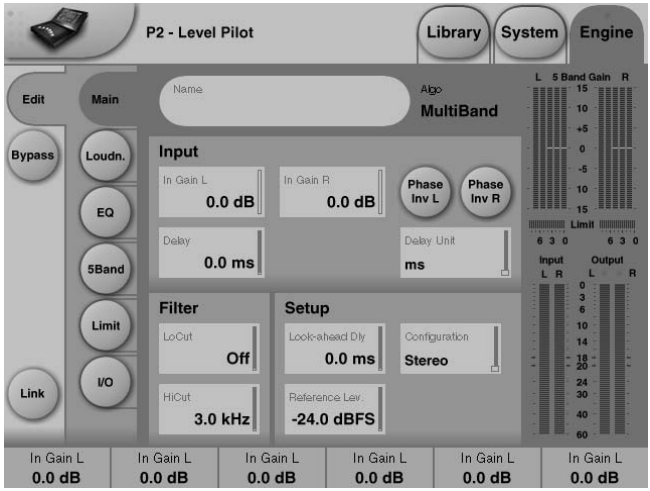
Analog In Offset
Range: -3 to +25dBu @ Full scale
Sets Analog Input level.

Analog Out Offset
Range: -3 to +24 dbu @ Full scale
Adjusts Analog Output gain to match downstream device.

Digital Level

Digital Out Offset
Range: -12dB to 0dB
The Digital Out Offset parameter controls the Digital Output level in accordance to the set Analog Scale Output level.

MAIN PAGE



In Gain
Range: 0dB to Off
Separate level controls for Left and Right Input (A and B).

Phase Inv
Range: Normal/Inverted
Press to phase invert channels A, B or both.

Delay
Range: 0-1000ms
Delay alignment of the Input channels. Depending on selected Configuration type, either one common Delay setting or individual delay settings are available.

Delay Unit
Range: ms, 24fps, 25fps, 30fps
With this parameter it is possible to select which unit the Delay parameter should be shown in. Changing this parameter does not affect the actual delay value.

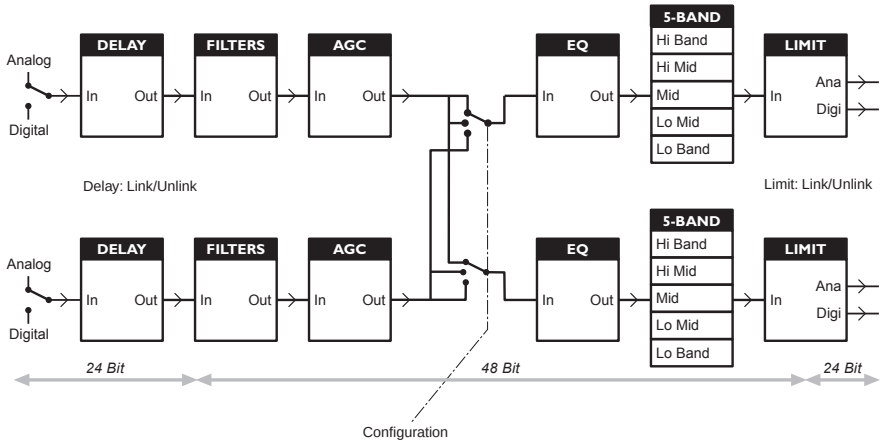
Lo Cut
Range: Off to 200Hz
Second order LoCut filter on both Inputs.

Hi Cut
Range: Off to 3 kHz
8th order HiCut filter on both Inputs.

Look-ahead Dly
Range: 0-15ms
If the 5 band Compression sections is set to use a very short Attack times (up to approx 10-15ms) overshoots may occur. The Look Ahead function allows the P2 to evaluate the material just before processing and artifacts can thereby be prevented.
Be aware that the Look Ahead delay function actually delays the Output signal.

Configuration

Processing Overview



Reference Level
Reference Level defines the standard operating level, and scales the Threshold and Target Level parameters of the Loudness control and Multiband section. The Threshold of the Limiter is not influenced by this setting, but is always relative to 0dBFS.
Typical Reference Level settings would be -20 dBFS in the America and some parts of Asia, and -18 dBFS in Europe, Japan and some parts of Asia.
If you wish to relate all levels to 0 dBFS, leave the Reference Level setting at 0 dBFS.

Analog vs. Digital level
If you use analog interfacing, remember always to set the relationship between absolute analog and digital level before adjusting parameters in the Engines.

Typical analog I/O level scaling would be +24dBu in the Americas and some parts of Asia, and +18dBu in Europe, Japan and some parts of Asia. The figure denotes the analog level required or produced for a 0dBFS signal.

Note 1: Be careful when changing between configurations. Moving from Dual Mono to Stereo will result from parameter settings of the left (or “A”) channel being copied into the right (or “B”) channel. Going from Dual Mono to Stereo and back to Dual Mono will therefore overwrite original right (or “B”) channel settings.

Note 2: In all configuration modes, linking of the Brickwall Limiter is set separately on the Limiter page. Some broadcasters like the sound of operating left and right limiting without stereo coupling because they feel that it maximizes loudness and widens the stereo image.
On dual mono sources, of course you should always choose un-linked Limiter operation.

Processing Modes

- **Stereo**. In this mode the Loudness, EQ and Multiband sections operate in tandem: Whatever gain change is applied to one channel, is applied to the other. Also, many parameters have mutual left and right controls.

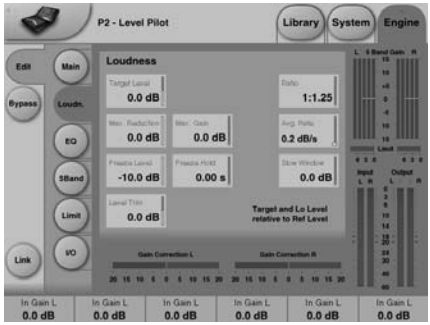
- **Dual Mono**. In this mode the Loudness, EQ and Multiband sections treat the two Input signals completely independently.

- **Stereo Wide**. In this mode the apparent width and image of stereo signal can be altered simultaneously with controlling loudness and peak level. The left and right signal is internally de-composed into an M(Mono) and S(Stereo) component, and reverted to left and right signals before peak limiting on the Output.

- **Sum Mono:** Left and right channels are summed after Delay, Filters and AGC.

- **Left Mono:** Left channel only is processed.

- **Right Mono:** Right channel only is processed.



Target Level
Range: +10dB to -10dB
This is the level the Loudness controller will aim at on its Output. Target Level is relative to Reference Level on the Main Page.

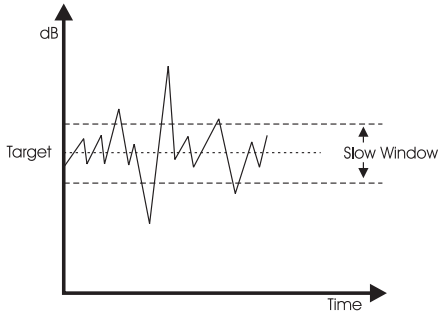
Max Reduction
Range: -20dB to 0dB
This is the maximum attenuation the Loudness Control is allowed to perform. If set to 0.0dB, the Loudness Control cannot attenuate the signal at all. The level diagram on the next page is shown with Max Reduction set at 0.0dB.

Max Gain
Range: 0 to +20dB
This is the maximum gain the Loudness Control is allowed to perform. If set to 0.0 dB, the Loudness Control cannot add gain to the signal at all.

Freeze Level
Range: -10dB to-40dB
Sets the minimum level required before the Loudness Control will start adding more gain. It would typically be set to avoid boosting signals considered noise. The Freeze Level parameter is relative to the Reference Level setting on the Main page.

Freeze Hold
Range: 0 to 5 seconds
When the Input signal drops below the Freeze Level, the Gain Correction of the Loudness Section is frozen for the duration of the Hold time. When the Hold period expires, the Gain Correction falls back to 0dB gain.

LOUDNESS PAGE



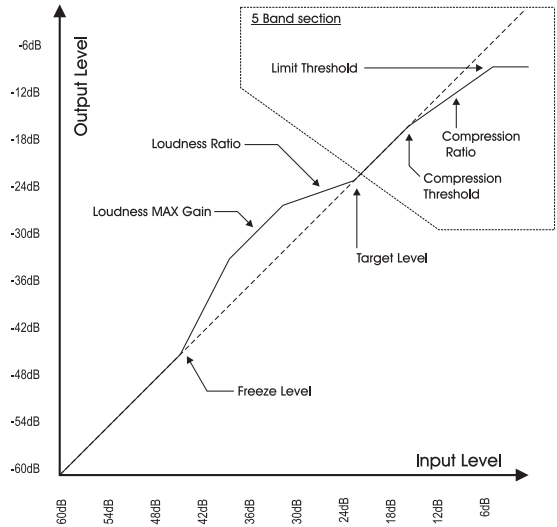
Level Trim
Range: -18dB to + 18dB
Because P2 operates with 48 bit precision on all audio internally, it is possible to correct loudness manually without the risk of overloads. The Level Trim can be used for permanent off-sets or live loudness adjustments.

Ratio
Range: 1:1.25 to 1:6
Ratio is the steering factor used when the Loudness Control applies boost or attenuation to reach the Target Level. The higher ratio, the more rigid steering towards the Target Level.

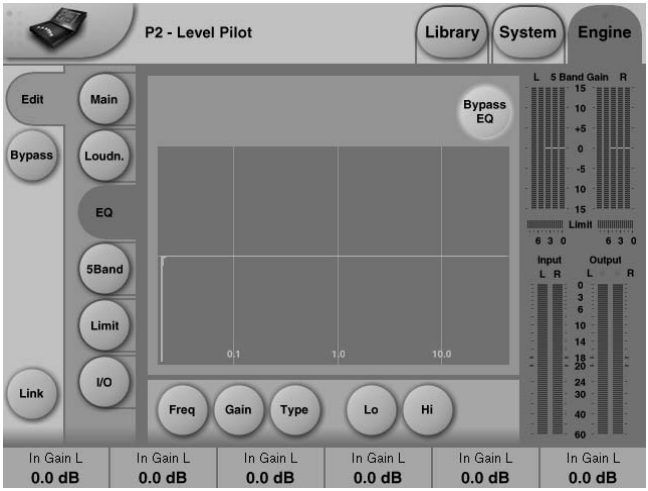
Average Rate (Avg Rate)
Time constants in the Loudness Control are changed dynamically with the Input signal based on computations by multi-level detectors. When the Output level is close to the Target Level, gain changes are relatively slow.

The Average Rate offsets all time constants to be faster or slower. Values below 1dB/Sec produces a gain change gating effect when the Output level is already in the target zone, while values above 4dB/Sec will add density to sound.

Slow Window
Range: 0 to 20 dB
The slow window is the area around the set Target Level.
Within the slow window the Loudness is only gently controlled. When the signal exceeds the limits of the Slow Window the Loudness is treated more radically. Depending on the set Average Rate and Ratio.



EQ Page



Introduction
This digital EQ features a three-band parametric EQ with high- and low-pass filters switchable between Notch, Parametric, Shelving and Cut filters. The needle sharp notch filter has a range down to 0.01 octave and the shelving filters has a variable slope, ranging from gentle 3 dB/oct over 6 and 9 to 12dB/oct. Cut filters are switchable between 12dB/oct maximum flat amplitude (Butterworth) or flat group delay (Bessel) types. The parametric equalizer features a natural and well defined bandwidth behavior at all gain and width settings.

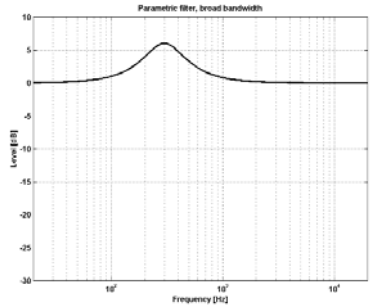
Basic operation
- Press keys **Lo, Mid and Hi** to activate/deactivate the EQ bands.
- Select Freq, Gain, Type or Lo/Hi to access all four parameters on individual bands.
- Press **Bypass EQ** to bypass all three bands.

Type Selector
- Press **Type** and use faders 1-3 to select filter types.

For Lo and Hi filters select between filter types:
Parametric, Notch, Shelve and Cut.

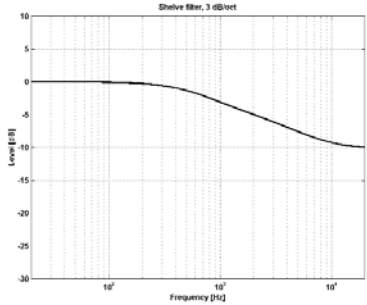
For the Mid filter select between filter types:
Parametric and Notch.

Parametric Filter - Broad type

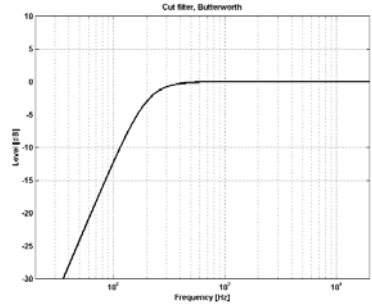


EQ PAGE

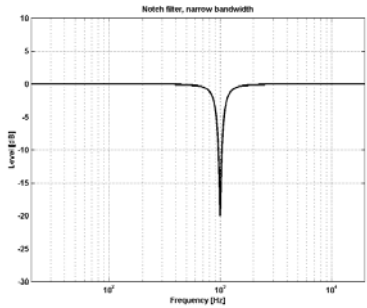
Shelving Filter



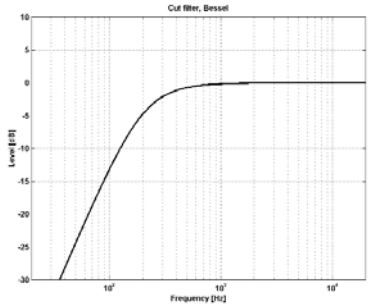
Cut Filter - Butterworth type



Notch Filter - Narrow Type



Cut Filter - Bessel type



Freq

Press **Freq** and use Faders 1 to 3 to adjust frequence for each of the three bands.

Range - Lo band : 20Hz to 20kHz
Range - Mid band : 20Hz to 20kHz
Range - Hi band : 20Hz to 40kHz

Gain

Press **Gain** and use Faders 1 - 3 to adjust gain for each of the three EQ bands.

<u>Range for the Parametric, Shelve and Cut type:</u>
Lo Gain : -12dB to +12dB
Mid Gain : -12dB to +12dB
Hi Gain : -12dB to +12dB

<u>Range for the Notch filter:</u>
Lo Gain : -100dB to 0dB
Mid Gain : -100dB to 0dB
Hi Gain : -100dB to 0dB

EQ PAGE

Type
Press TYPE and use Faders 1-3 to set BW value for each of the three EQ bands.

Range for the Notch filter:
Lo BW : 0.02oct to 1oct
Mid BW : 0.02oct to 1oct
Hi BW : 0.02oct to 1oct

Range for the Parametric filter:
Lo BW : 0.1oct to 4oct
Mid BW : 0.1oct to 4oct
Hi BW : 0.1oct to 4oct

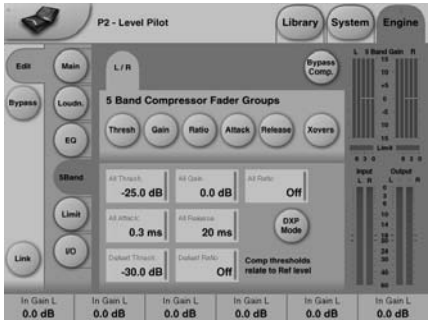
Range for the Shelve filter:
Lo BW : 3dB/oct to 12dB/oct
Hi BW : 3dB/oct to 12dB/oct

Range for the Cut filter:
Lo BW : Bessel or Butterworth
Hi BW : Bessel or Butterworth

Bandwidth/Q - Key-Values:

BW		**Q**
0.5	-	2.87
0.7	-	2.04
1.0	-	1.41

5-BAND PAGE



Xovers
Press this button to access the four cross-over points between the five-bands. The parameters are Automatically assigned to faders 1-4.
Parameter range:
Xover 1: Off to 1.6kHz
Xover 2: Off to 4kHz
Xover 3: 100Hz to Off
Xover 4: 250Hz to Off

Defeat Thresh
Range: -3 to -30dB
This is a unique control which defeats gain from the multiband compressor below a certain threshold. No matter the spectral shaping applied from multiband system, below the Defeat Threshold, the frequency response is flat and gain is unity.
Defeat Threshold is relative to Compressor Threshold, which is relative to Reference Level.

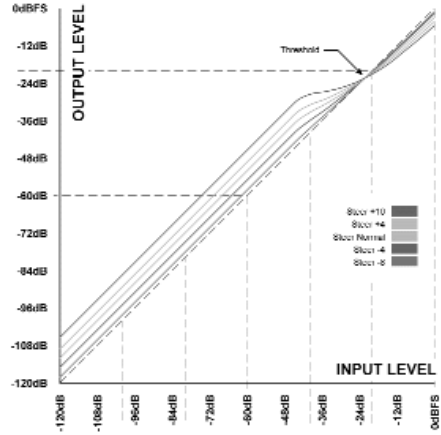
Defeat Ratio
Range: Off to Infinity
Controls how close to the Defeat Threshold the make-up gain of the compressor is counteracted. At high ratios, the signal only has to be slightly below the Defeat Threshold before the compressor gain is fully defeated.

Thresholds A & B
Parameter range: -25 to 20dB
Press this button to access the five individual band Thresholds and the overall All Threshold.

NOTE Threshold relative to Reference Level is set at the Main page.

Gain
Parameter range: 0 to 18dB
Press this button to access the five individual band Gains and the overall All Gain.

DXP Mode - introduction
The 5-band section is either in normal compression mode, or DXP mode. Instead of attenuating signals above a certain threshold, DXP mode (Detail Expansion) lifts up signals below the Threshold; thereby bringing out details rather than squashing the loud parts. DXP mode therefore is capable of adding intelligibility and air to speech, lifting harmonics, or emphasizing ambience without increasing overall peak level.



As shown on the illustration, gain is positive below threshold, unity at Threshold, and the effect decreases above Threshold. In DXP mode, Ratio becomes Steer. Steer can be regarded as an adaptive Ratio that gradually approaches 1:1 above the threshold.

Multiband DXP
DXP mode can be used with any number of bands up to 5. When used, multiband it is particularly effective in bringing out air and clarity.
The processor can act as an automatic EQ that removes a boost when it's not needed: At very low levels, where noise is dominant, and at loud levels where sibilance would become a problem. Besides from being effective on speech, DXP mode can be used in mastering to bring up low levels, e.g. when preparing film or concerts for domestic or noisy environment listening.

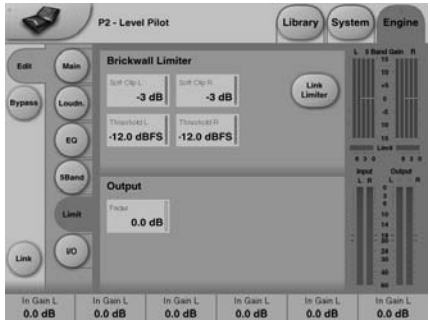
Try setting the Steer and/or Threshold parameters differently in the bands to hear the effect. High Steer values add more detail gain than low values, but remember that Threshold has to be negative to add detail gain at all. DXP Threshold relates to the Reference Level set on the Main page.

NOTE To disable DXP detail gain at very low levels, use the Defeat Threshold and Defeat Ratio controls. Defeat threshold relates to the DXP threshold, and allows for a certain level-window, inside which detail gain is applied. Defeat Ratio determines the slope at which DXP detail gain is defeated.

Ratio - DXP mode OFF
Parameter range: Off to Infinity:1
Press this button to access the five individual band Ratios and the overall All Ratio.
The parameters are Automatically assigned to fader 1-6.

Attack
Parameter range: 0.3 to 250ms
Press this button to access the five individual band Attacks and the overall All Attack.
The parameters are automatically assigned to fader 1-6.

Release
Parameter range: 20ms to 7s
Press this button to access the five individual band Release and the overall All Release.
The parameters are automatically assigned to fader 1-6.



Link Limiter
Range: On/Off
When Link is active, the same amount of peak limiting is always applied to both channels.

Some broadcasters like the sound of operating left and right limiting without stereo coupling because they feel that it maximizes loudness and widens the stereo image. On dual mono sources, of course you should always choose un-linked Limiter operation.

NOTE The Configuration control on the Main page does not affect the Link Limiter setting. This link is running individually from the selected configuration.

Softclip A/L and B/R
Parameter range: - 3dB to Off
When active, Soft Clip applies a saturation effect on signals close to maximum Output level. The threshold is relative to the Threshold of the Brickwall Limiter.
This controlled distortion of transients works well for adding loudness, but is not a desirable effect with some data compression codecs. While the Brickwall Limiter is extremely low distortion, Soft Clip is not. Use your own judgement if you want it or not.

Threshold A/L & Threshold B/R
Parameter range: -12 to 0.0dBFS
Sets the Threshold of the Brickwall Limiter.
The Threshold is relative to 0 dBFS, not to the Reference Level set on the Main page.

The Brickwall Limiter uses 48 bit processing with distortion figures surpassing the quality demands of DVD-Audio mastering.
Oversampling is used to prevent intersample

peaks from reaching the Output, and time-constants adapt to the Input signal.

Fader A & Fader B
Parameter range: Off to 0dB
Fader function on the Output. When Dual Mono configuration is selected, individual Output faders are available.

Reset menu & software load

To enter the following functions hold WIZARD key while powering up the unit. Once entered this menu navigation is as follows:

- **Press PRESET keys 4 and 8 to scroll in menu.**
- **Press LOCK to confirm/enter**
- **Press BYPASS to cancel**

“L” - Load
Indicates Load mode and is used when loading application software.
Press LOCK (enter) to load the information present in the inserted PCMCIA card.

“R” - Reset
Press LOCK (enter) to reset the unit.
When LOCK is pressed once the “R” in the display will start to flash and the unit is ready to be reset.
You can now abort/cancel the operation by pressing the BYPASS key or press LOCK a second time to actually reset the unit.
While resetting a “+” is displayed.

“A” - Boot software version
Press LOCK (enter) to see current loaded boot software version.
For service-purposes only.

“V” - Operating software number
Press LOCK (enter) to see current loaded P2 software version.

“N” - Serial Number
Press LOCK (enter)to see serial number for this unit.

“S” - Start
Reboots the P2 for normal use.
When rebooted after a Reset procedure has taken place all Front Presets are reconfigured. The reconfiguration process takes approx. 15 seconds during which the eight PRESET key LEDs will flash. Be patient.

Loading Preset Banks

The P2 is loaded with the 8 presets from the Default F1 bank (see page 37). These are the presets accessible from the Front Panel . However, it is possible to load other banks into the front panel. To do this:

- Press and hold LOCK when powering up. All key LEDs will flash.
- Press the key equivalent to the bank you wish to load to the front panel.
- Now the LEDs in the LOCK and BYPASS keys will flash.
- Press LOCK (green LED) to proceed/confirm loading the selected bank or press BYPASS (red LED) to decline/exit the bank load mode.

Notes

Reboot the TC Icon PC Editor between connecting different P2 units.

Port Conflict

Another active application may conflict with the serial ports you have selected on the: Setup - Devices - Ports page.
If this is the case the following screen will appear.

There are two options to resolve this problem:

1 Connect the P2 to another physical COM port and select this COMport an the COM port page.

2 Close the conflicting application.

APPENDIX - TECHNICAL SPECIFICATIONS

Digital Inputs and Outputs

Connectors:	XLR (AES/EBU), RCA Phono (S/PDIF)
Formats:	AES/EBU (24 bit), S/PDIF (24 bit), EIAJ CP-340, IEC 958
Output Dither:	HPF TPDF dither 8-22 bit
Word Clock Input:	BNC, 75 ohm, 0.6 to 10 Vpp
Sample Rates:	32 kHz, 44.1 kHz, 48 kHz
Processing Delay:	0.5 ms @ 48 kHz
Additional Delay:	0-1000 ms at all sample rates
Frequency Response DIO:	DC to 23.9 kHz ± 0.01 dB @ 48 kHz

Sample Rate Conversion

Type:	Asynchronous
Dynamic Range:	120 dB
THD+N:	-106 dB 44.1 to 48 kHz @ 1 kHz, -2 dBFS
Input Rate Range:	31 kHz to 49 kHz

Analog Inputs

Connectors:	XLR balanced (pin 2 hot)
Impedance:	20 kohm (balanced)
Max. Input Level:	+28 dBu (balanced)
Min Input Level (for 0 dBFS):	-4 dBu (balanced)
A to D Conversion:	24 bit (1 bit, 128 times oversampling)
A to D Delay:	0.8 ms @ 48 kHz
Dynamic Range:	>103 dB (unweighted), >106 dB(A)
THD:	-95 dB (0.0018 %) @ 1 kHz, -6 dBFS (FS @ +18 dBu)
Frequency Response:	10 Hz to 20 kHz: +0/-0.2 dB
Crosstalk:	<-80 dB, 10 Hz to 20 kHz, typical –100 dB @ 1 kHz

Analog Outputs

Connectors:	XLR balanced (pin 2 hot)
By-pass:	Through relay
Impedance:	40 ohm (balanced)
Max. Output Level:	+26 dBu (balanced)
Full Scale Output Range:	-4 dBu to +26 dBu (balanced)
D to A Conversion:	24 bit (1 bit, 128 times oversampling)
D to A Delay:	0.57 ms @ 48 kHz
Dynamic Range:	>100 dB (unweighted), >104 dB(A)
THD:	-86 dB (0.005 %) @ 1 kHz, -6 dBFS (FS @ +18 dBu)
Frequency Response:	10 Hz to 20 kHz: +0/-0.5 dB
Crosstalk:	<-60 dB, 10 Hz to 20 kHz, typical –90 dB @ 1 kHz

EMC

Complies with:	EN 55103-1 and EN 55103-2 FCC part 15, Class B CISPR 22, Class B

Safety

Certified to:	IEC 60065, EN 60065, UL 6500 and CSA E65 CSA FILE #LR108093

Environment

Operating Temperature:	32° F to 122° F (0° C to 50° C)
Storage Temperature:	-22° F to 167° F (-30° C to 70° C)
Humidity:	Max. 90% non-condensing

PCMCIA Interface

Connector:	PC Card, 68 pin type 1 cards
Standards:	PCMCIA 2.0, JEIDA 4.0
Card Format:	Supports up to 2 MB SRAM

Control Interface

RS232	9 Pin SUB-D
GPI, Pedal, Fader:	1/4 inch phone jack

General

Finish:	Anodized aluminum face and top plate Plated and painted steel chassis
LCD:	56 x 128 dot graphic LCD-display
Dimensions:	19" x 1.75" x 8.2" (483 x 44 x 208 mm)
Weight:	5.2 lb. (2.35 kg)
Mains Voltage:	100 to 240 VAC, 50 to 60 Hz - (auto-select)
Power Consumption:	<20 W
Backup Battery Life:	>10 years

Warranty

Parts and labor:	1 year

Due to continuous development these specifications are subject to change without notice.

SELF TEST

Available from Software 1.20 and up.

Accessing Self test
- Press and hold the “BYPASS” key, while powering up to access the self test.
- Press PRESET 8 to increase test number.
- Press PRESET 4 to decrease test number.
- Press LOCK to enter a test and acknowledge OK result.
- Press BYPASS to acknowledge bad result.
- The test number is shown in the OPTIMIZE display. The self tests are described below.

Test 0 - LED test
Turns all LEDs on.

Test 1 - Analog In/Out test
Connect a balanced cable between ONE analog Output and ONE analog Input.
The Input meter for the used Input should show -12dB.
The symbol “+” will indicate that the test for the used I/O is okay.
The symbol ”-” will indicate that the Input or Output is not okay. If so, try the test with the other analog Input/Output to narrow down the problem.
Connect the cable to the other Output and Input in order to test these.

Test 2 - AES/EBU In/Out test
Connect a balanced cable between AES/EBU Input and Output.
The INPUT meters should show 0dB. The symbol “+” will indicate that the test is okay.
The symbol ”-” will indicate that the Input or Output is not okay.

Test 3 - S/PDIF In/Out test
Connect a RCA cable between S/PDIF Output and Input.
The Input meters will show 0dB.
The symbol “+” will indicate that the test is okay.
The symbol “-” will indicate that the Input or Output is not okay.

Test 4 - RS232 remote I/O test
Connect Rx and Tx on the RS-232 connector (pin no. 2 to pin no. 3).
The symbol “+” will indicate that the test is okay. The symbol “-” will indicate that the Input or Output is not okay.

Test 5 - GPI Input test
Connect a switch between the Tip and Sleeve of the GPI Input jack.
When the switch is closed (tip is connected to ground) the symbol “+” is shown, otherwise the symbol “-” is shown.

Test 6 - Battery test
The battery voltage is tested and if within limits the symbol “+” is shown, otherwise the symbol “-” is shown.

Test 7 - System test
The ASIC, DSP, DSP RAM and EEPROM are tested while **"7"** is flashing. If OK the symbol “+” is shown, otherwise the symbol “-” is shown.

Test 8 - Ex.RAM test
The Ex.RAM memory board is tested during 1 minute while "8" is flashing.
If OK the symbol “+” is shown, otherwise the symbol “-” is shown.

NB! This test is NOT implemented in application software v. 1.01

Service Note
In case of the unlikely event that the unit needs to be sent in for service, please pack it in the original box AND an outer box before sending it.

PRESET LIST - SW 1.50

No	Name	Screen Notes	Input	Max	Scale	Design Notes
F1	**Default**					
1	NAB Limit A	Analog Input Limiter. US Std. SMPTE RP155	Ana	-6	+24	SMPTE RP155 (adj. 1.10)
2	NAB Limit D	Digital Input Limiter. US Std. SMPTE RP155	Digi	-6	+24	SMPTE RP155 (adj. 1.10)
3	EBU Limit A	Analog Input Limit. EU Std. EBU R68	Ana	-9	+18	IEC 268-10, R68-2000 (adj. 1.10)
4	EBU Limit D	Digital Input Limit. EU Std. EBU R68	Digi	-9	+18	IEC 268-10, R68-2000 (adj. 1.10)
5	NAB Optimize A	Analog Dual Input. US Std. SMPTE RP155	Ana	-6	+24	SMPTE RP155, Dual
6	NAB Optimize D	Digital Dual Input. US Std. SMPTE RP155	Digi	-6	+24	SMPTE RP155, Dual
7	Level Pilot A	Analog Input Wide Range ALC. EBU R89	Ana	-3	+18	
8	Level Pilot D	Digital Input Wide Range ALC. EBU R89	Digi	-3	+18	
F2	**Intern. Standard. A**					
1	JP-N Limit A	Analog Input Limit. National TV, Japan	Ana	-8	+22	-18 ref, NHK Lim (TV prod), (adj. 1.10)
2	JP-N Limit D	Digital Input Limit. National TV, Japan	Digi	-8	+22	-18 ref, NHK Lim (TV prod), (adj. 1.10)
3	Tele France Limit A	Analog Input Limit. TF1 & France 2, France	Ana	-9	+22	
4	Tele France Limit D	Digital Input Limit. TF1 & France 2, France	Digi	-9	+22	
5	BBC Limit A	Analog Input Limit. BBC, UK	Ana		+18	IEC Type IIa, BS 6840 p10
6	BBC Limit D	Digital Input Limit. BBC, UK	Digi		+18	IEC Type IIa, BS 6840 p10
7						
8						
F3	**Intern. Standard. B**					
1	CBC Limit A	Analog Input Limit. CBC, Canada	Ana	-6	+24	-20 ref (v. 1.01 NAB preset)
2	CBC Limit D	Digital Input Limit. CBC, Canada	Digi	-6	+24	-20 ref (v. 1.01 NAB preset)
3	OP 36 Limit A	Analog Input Limit. OP36, Australia	Ana	-6	+24	-20 ref
4	OP 36 Limit D	Digital Input Limit. OP36, Australia	Digi	-6	+24	-20 ref
5	Reserved					
6	Reserved					
7	Reserved					
8	Reserved					

PRESET LIST - SW 1.50

No	Name	Screen Notes	Input	Max	Scale	Design Notes
F4	**Reserved**					
1	Reserved					
2	Reserved					
3	Reserved					
4	Reserved					
5	Reserved					
6	Reserved					
7	Reserved					
8	Reserved					
F5	**Live Mix**					
1	Mix Pilot	General purpose Mix Assistant. Digital In	Digi	-0	+24	
2	News	News Mix Assistant. Digital In, Dual Mono	Digi	-6	+24	Dual
3	Gameshow	Gameshow Mix Assistant. Digital In	Digi	-3	+24	
4	Live Sports	Live sports Mix Assistant. Digital In	Digi	-3	+24	
5	Reserved					
6	Reserved					
7	OptiLink, Dual	Link and OB Optimize. Digital In, Dual Mono	Digi	-1	+24	Dual, ALC
8	OptiLink, Stereo	Link and OB Optimize. Digital In	Digi	-1	+24	ALC
F6	**Mastering**					
1	CD Master	CD Master to Commercial specs. Digital In	Digi	0	+24	
2	CD Master EBU	CD Master complying to EBU R89. Digital In	Digi	-3	+18	
3	Codec Master	Master for MP3, AC3 and DTS delivery. Digi In	Digi	-0.5	+24	
4	Ambi Boost Master	Master with Low Level Detail Boost. Digi In	Digi	0	+24	
5	Music to LtRt	Music Anti-Collapse for Matrix Playback. Digi In	Digi	0	+24	
6	Film to Domestic	Film to Domestic Dynamic Range Shift. Digi In	Digi	-1	+24	ALC
7	Optical Limit	Limit Optical LtRt Film Sound. Digital In	Digi	-3	+24	
8	Optical Optimize	Optimize Optical LtRt Film Sound. Digital In	Digi	-3	+24	

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No	Name	Screen Notes	Input	Max	Scale	Design Notes
F7	**Reserved**					
1	Reserved					
2	Reserved					
3	Reserved					
4	Reserved					
5	Reserved					
6	Reserved					
7	Reserved					
8	Reserved					
F8	**Live Mix**					
1	STL Relax	Radio STL Optimize. Shape: Flat	Ana	-3	+24	
2	STL Energy	Radio STL Optimize. Shape: Loudness	Ana	-3	+24	
3	STL Sky	Radio STL Optimize. Shape: Crisp	Ana	-3	+24	
4	STL Autobahn	Radio STL Optimize. Shape: Core	Ana	-3	+24	
5	STL Signature	Radio STL Optimize. Shape: Core Wide	Ana	-3	+24	
6	Reserved					
7	Reserved					
8	Reserved					